

## Checkpoint

What volume of 1.25M KI solution can you make with 125mL of 3M KI solution?

Your blood contains about 0.72% (v/v) white blood cells (leukocytes). Assuming you have a blood volume of about 4.0L, what volume of pure leukocytes is present?

What mass of strontium carbonate,  $\text{SrCO}_3(s)$  can be precipitated from 50mL of 0.165 M Strontium Nitrate,  $\text{Sr}(\text{NO}_3)_2(aq)$ , by adding excess sodium carbonate,  $\text{Na}_2\text{CO}_3(aq)$ ?

Nov 26-8:27 AM

## Checkpoint

What volume of 1.25M KI solution can you make with 125mL of 3M KI solution?

*before after*  
 $C_1 V_1 = C_2 V_2$   
 $(3M)(0.125L) = (1.25M) V_2$   
 $V_2 = \frac{0.375 \text{ mol}}{1.25 \text{ mol/L}} = 0.3L$

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## Checkpoint

Your blood contains about 0.72% (v/v) white blood cells (leukocytes). Assuming you have a blood volume of about 4.0L, what volume of pure leukocytes is present?

$$\frac{0.72}{100} = 0.0072 = \frac{XL}{4.0L}$$

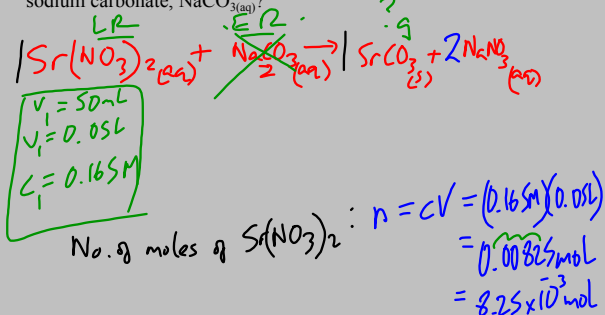
$$XL = (4.0L)(0.0072)$$

$$= 0.0288L \text{ or } 28.8 \text{ mL}$$

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## Checkpoint

What mass of strontium carbonate,  $\text{SrCO}_3(s)$  can be precipitated from 50mL of 0.165 M Strontium Nitrate,  $\text{Sr}(\text{NO}_3)_2(aq)$ , by adding excess sodium carbonate,  $\text{Na}_2\text{CO}_3(aq)$ ?



Mole Ratio = 1:1  
 $\therefore$  Moles of  $\text{SrCO}_3$  produced =  $8.25 \times 10^{-3} \text{ mol}$   
 Mass of  $\text{SrCO}_3 = (8.25 \times 10^{-3})(147.62) = 1.218g$

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### Solution Stoichiometry

- We have already explored **gravimetric** (mass-to-mass) **stoichiometry**.
- However, most industrial reactions take place in solution
  - Easier to manipulate and control
  - Many chemical reactions only occur if the reactants are in solution
- Solution stoichiometry (or **volumetric stoichiometry**) is a method of calculating the concentration of substances in solution

### Steps to Solving Solution Stoichiometry Problems

- Write the balanced chemical equation
- Step up a stoich table

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OR

- Write the balanced chemical equation
- Convert given values to moles
- Use the mole ratio to solve for unknowns

Nov 28-19:58

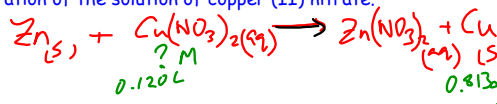
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Example: A 10.00 mL sample of sulfuric acid reacts completely with 15.9 mL of a 0.150 mol/L potassium hydroxide solution. Calculate the molar concentration of the sulfuric acid.

$\text{H}_2\text{SO}_4(\text{aq}) + 2\text{KOH}(\text{aq}) \rightarrow 2\text{H}_2\text{O}(\text{l}) + \text{K}_2\text{SO}_4(\text{aq})$

	$\text{H}_2\text{SO}_4(\text{aq})$	+	$2\text{KOH}(\text{aq})$	$\rightarrow$	$2\text{H}_2\text{O}(\text{l})$	+	$\text{K}_2\text{SO}_4(\text{aq})$
C	$\frac{1.19 \times 10^{-3} \text{ mol}}{0.010 \text{ L}}$		0.15 M				
n	$1.19 \times 10^{-3} \text{ mol}$		$0.00238$ $2.38 \times 10^{-3} \text{ mol}$				
V	10 mL		15.9 mL				

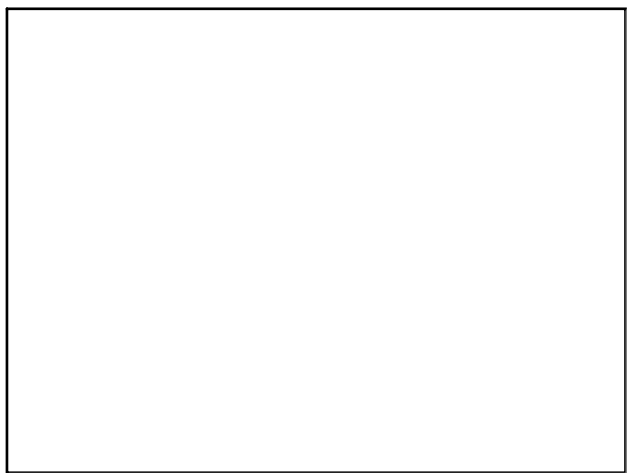
A strip of zinc metal was placed in a beaker that contained 120 mL of a solution of copper (II) nitrate,  $\text{Cu}(\text{NO}_3)_2(\text{aq})$ . The mass of copper produced was 0.813 g. Find the initial concentration of the solution of copper (II) nitrate.



More Practice: Work on the solution stoichiometry handout provided by Mr McCormack

Nov 28-20:18

Nov 28-20:46



Nov 27-7:48 PM